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[Despatch Abstract.]

CINCHONA : QUININE POLICY : CONFERENCE HELD IN APRIL 1948 AT NEW DELHI UNDER AUSPICES OF CENTRAL MINISTRY OF HEALTH MINUTES : RECORDED.

CINCHONA DEPARTMENT.

From
A.Y. Swamy, Esq.,M.A.,M.Sc.,
Tech. (Manchester),
Director, Cinchona Department,
Ootacamund.

To
The Secretary to the Government
of Madras,
Development Department,
Fort St. George, MADRAS

Rc. No. 1153-A2/48 dated 16th June 1948.

Sir,

Sub: CONFERENCE ON QUININE POLICY held in New Delhi on 23rd April 1948.
Ref: Government Memorandum No. 62438-K/48.Dev. Dpptt. dated the 2nd June 1948.

I have the honour to submit herewith my report on the meeting of the Quinine Policy Committee at New Delhi on 23rd April 1948.w I regret the delay in submitting this report which was due to my waiting for the official minutes of the Conference. which was received be me on 30th May 1948. I considered it desirable to wait for the official minutes from Delhi as the discussions at the Conference involved a large volume of different opinions that though I was sure of the decisions reached there, I wanted to avoid any possible misunderstandings of the conclusions and decisions arrived at.

2. As enclosures to my report I am forwarding the following -

(i) Agenda for the meeting of the Quinine Policy Committee;

(ii) A note by the Principal Quinine Officer, Government of India on the future policy and the production of anti-malarials in India;

(iii) A note by Col. Jaswant Singh, Director, Malaria Institute of India

(iv) Statistics regarding quinine and Quinine substitutes; a n d

(v) A tabulated statement of stocks of various drugs, quantities used during 1944-47 and estimated requirements for 1949 of the Army Medical Stores in India.

3. I am also forwarding separately a copy of the official minutes of the Conference received from the Government of India.

I have the honour to be,
Sir,
Yout most obedient servant,

Sd/ Director, Cinchona Deptt.

REPORT ON THE MEETING OF THE QUNINE POLICY COMMITTEE AT NEW DELHI
on 23rd April 1948 at 3 p.m.

A Committee was constituted by the Government of India to meet at a Conference, discuss and decine as to what the future policy of Government should be with regard to the indigenous production of quinine. The Committee was a representative one and met at 3 P.M. on 23rd April 1948 and consisted of the following members.

(a) Civil Health Services of the Central Government:

(1) Mr. P.M. Menon	Joint Secretary, Ministry of Health
(2) Dr.K.C.K.E. Raja	Dy. Director-General of Health Services.
(3) Lt.Col.M.K.Kelavkar	Drugs Controller, Directorate-General of Health Services, New Delhi.
(4) Sri Ram Nath Chopra	Chairman, Committee on the Indigenous Systems of Medicine, Govt. of India.
(5) Dr.B.C. Das Gupta	Adl Dy.Director-General of Health Services (Public Health).
(6) Lt.Col. T.C. Puri	-do- -do-
(7) Lt.Col.Jaswant Singh	Director, Malaria Institute of India.
(8) Dr. I.M. Puri	Dy.Director, -do-
(9) Mr. P.M. Nabar	Chief Advisory Chemist, Directorate General of Health Services.
(0) Mr. S.C. Sen	Principal, Quinine Officer, Government of India and Director, Cinchona Department, Bengal.
(11) Mr. J.N. Saxena	Assistant Secretary, Ministry of Health.
(12) Dr. D.C. Sen	Representative of the Ministry of Industry and Supply.

Military Health Services

(13) Col.K.M. Barucha	Dy.Director of Hygiene and Pathology, Medica Directorate, General Headquarters, India.
(14) Lt.Col.B.N. Bhandari	Army Specialist in Medicine, Medical Directorate, General Headquarters. India.

Provincial Governments' Representatives:

(15) Dr.A.C. Banerjea	Director of Health and Medical Services, United Provinces.
(16) Prof.R.B.Chaudhuri	Professor of Tropical Medicine, School of Tropical Medicine, Calcutta.
(17) Dr. B.H.P. Pai	Professor of Medicine, Madras Medical Colleg
(18) Dr.D.K.Viswanthan	Asst. Director of Public Health (Malariology Bombay.
(19) Dr.Daulat Ram Mehta	Public Health Department, East Punjab
(2) A.Y. Say Swamy	Director, Cinchona Department (Ootacamund) Madras.

2. The Conference was presided over and opened by Dr. Jivraj Mehta, Director-General of Health Services with an address to the members. First of all he thanked all the members present for responding to the invitation at such short notice. Then referring to the note prepared by Mr. S.C. Sen for this Conference he agreed that the Government of India had in the past been rather slow in taking decisions and hoped that this would be rectified in the future. He explained the present position of India with regard to Quinine (genera lly as explained in Mr. Sen's note) and requested the members to give their deep consideration to the questionnaire set down in the agenda and exhorted them to bear in mind national as well as Medical and Public Health considerations while making their recommendations. Starting with the first question on the agenda, namely, " Is Quinine an essential drug for the treatment of malaria even with the availability of synthetic antijalarial durgs in sufficient quantities", Dr. Jivraj Mehta invited Sir R.N. Chopra, the well known authority on drugs, to open the discussion by offering his own opinion.

3. Sri R.N. Chopra said that, so far as his experiance went, all the claims made for Paludrine by the manufacturers had not been borne out or substantiated. Quinine, in his opinion, was still the only safe and sure remedy for all forms of malaria. He warned that it would be a dangerous thing to give up manufacture of quinine in India just because some synthetic antimalaria

because some synthetic antimalarial drugs have appeared on the market. We should be self-sufficient in this country with regard to quinine or other anti-malarials and should not depend on foreign countries for supplies. Further discussion then followed. Dr. Pai of Madras thought that Quinine was losing its field to Pauldrine and that Cinchona should not be expanded. Dr. R.N. Chaudhury of the Calcutta Tropical School of Medicine said that so far, Paludrine had proved to be a potent and useful drug but on that account Quinine should not be given up. He considered that quinine is still having its own value and should continue to be produced in the country but any expansion of the industry should be limited and cautious. Similar views were expressed by others and the consensus of opinion was that the answer to question 1 on agenda was "YES" - the question reading "Is quinine an essential drug for the treatment of malaria even with the availability of synthetic antimalarial drugs in sufficient quantities"

Proceeding to question 2 on the agenda next which reads "Taking into consideration the minimum quantity of quinine, if any, considered essential for the treatment of Malaria as well as the quinine required for the treatment of other conditions of ill-health, what is the estimate of the probable annual requirement of the drug for the country?" a reference was invited to the Principal Quinine Officer's note where the pre-war estimate of the Indian requirement is stated to be 600,000 lbs. of quinine per annum though the actual consumption was only 210,000 pounds. The Health Survey and Development Committee of the Government of India after a careful assessment of the country's requirements, ~~of quinine~~ estimated the total requirements of India as 1,500,000 lbs. of quinine or its equivalent on the basis of one hundred million cases of malaria per year, but they recommended a target of half this quantity of quinine for self-sufficiency for the present. Out of this a limit of 210,000 lbs. per annum was fixed for quinine which was the pre-war figure of consumption and the balance of 540,000 lbs. in terms of quinine, was allowed for synthetic anti-malarials to be manufactured in India. The Health Minister's Conference of October 1946, adopted a target of 200,000 pounds of quinine per annum, with the proviso that the target is to be reviewed from time to time and agreed that the manufacture of synthetic anti-malarials also should be taken up in India. The industries and Supplies Department have recently suggested a large scale expansion of cinchona cultivation and the Planning and Development Department's planel on five chemicals, drugs and pharmaceuticals, recommended the production of 2,000,000 lbs. of quinine and a simultaneous production of 150,000 lbs. of mepacrine. Considering all points it was decided that the production of cinchona should be expanded for the present to a total production in both Bengal and Madras Factories of 200,000 to 250,000 lbs of quinine. This limit allows for full scale production by both the Naduvattam and the New Modern Quinine Factory in the Anamallais. The distribution of this production will be roughly one lakh of pounds for the Bengal factory and one to one and a half lakhs of pounds for the Madras Factories.

5. Coming to question 3, - the answer followed qucikly after the above decision in paragraph (4) and the Committee recommended that during the next five years, the Madras Cinchona Plantations should be expanded by five to six thousand acres and the plantations in Bengal by two thousand five hunded acres and that the position should be reviewed after five years. Question 3 reads "Until such time as synthetic anti-malarials and the requisite basic chmicals can be manufactured on a large scale in India, what should be the policy as regards Cinchona cultivation? Should it be expanded, and if so, to what extent within the next five years.

6. Having come to the conclusion that quinine was necessary for the treatment of Malaria, in spite of the presence in the market of Paludrine and similar syntehtics and also having decided to expand the cinchona industry to a total production in both Bengal and Madras of two to two and a half lakhs of pounds of quinine sulphate, it was next considered (question 4) as to whether any safeguards are necessary to protect the industry and what such safeguards should be; Question 4 reads "Are safeguards necessary for the survival of the quinine

industry in India: If so, what safeguards can be suggested and for what period?" I said that in as much as the producing provinces of Madras and Bengal were producing quinine for use in the whole of India they were entitled to expect support and protection for the industry from the Central Government besides a general support from all consuming provinces and states for the Indian manufactured cinchona products. The Madras Government undertook a very large expansion of cinchona plantations during the war years and had also commenced the construction of a New Modern Quinine Factory, which is now nearing completion, at a cost of over twenty-five lakhs of rupees. All this make India self-sufficient in regard to quinine; and in doing it, we have been incurring heavy expenditure at more or less inflated war time levels. Cinchona is a long term crop and most of this expansion was work was decided on and commenced long before the apperance of Paludrine in the market. Having nearly completed the new factory there is no going back now on it and expansion of plantations must continue till the plantations are of sufficient size to keep the new and old factories working continuously and to full capacity. Taking the total requirements of quinine for the whole of India as 1,500,000 pounds as estimated by the Health Survey and Development Committee of the Government of India the present production of about one lakh of pounds by both Madras and Bengal is only seven per cent of less and the target production of two to two and a half lakhs of pounds of quinine now fixed at this Conference will only be some 14 to 17 per cent of the total requirements of India. For the balance of 83 to 93 per cent of the requirements the country will still have to rely on imports either of quinine or of synthetics. There is, therefore, plenty of room for the manufacture of both quinine and synthetics in the country. There is only one question that was raised and that is whether our Indian manufactured quinine will be as cheap as imported paludrine. I submitted that while we will make all efforts to lower the cost of production of quinine about 90 per cent of which is incurred in the plantations in growing bark, this point of cost should not be given too much importance at this stage, because the bulk of the plantation now under cinchona was raised during war years at war time costs and at a time when quinine position in India was very critical. The selling prices of synthetic at any one time cannot be taken as standard or as indicating their actual cost of production. The manufacturers may start selling synthetics at an abnormally low price for some time in the beginning just to oust quinine from the market and to smash the quinine industry. When once they succeed in this and establish their products in the market they may begin to dictate terms and raise prices and we would then be entirely at the mercy of the foreign manufacturers. As an instance of their business methods it is appropriate to bring to the notice of Government that Mepacrine which was once sold at about Rs.22 and later reduced to Rs.13/8/- or Rs.14 and is now be being offered at Rs.5 per 1000 tablets (vide bottom of page 3 under Mepacrine Hydrochloride of statistics regarding quinine and quinine substitutes - enclosure A) and it is authoritatively learnt that the Imperial Chemical Industries Ltd., are shortly going to launch a propaganda drive by distributing mepacrine tablets free and at the same time canvassing for Paludrine. They are going to do this, because they have got a very large stock of Mepacrine tablets remaining unsold and this drug which just a couple of years ago was acclaimed as a god-send is now not wanted by anybody and Government of India themselves are rather worried about the very large stock of Mepacrine which they are holding as reserve stock and is said to be valued at about twenty five lakhs of rupees. When Dr. Jeevaraj Mehta asked if the army authorities could use up this stock, the Army Medical Officers said that they had completely given up the use of both quinine and mepacrine in the army and that they were using only Paludrine which was "the latest" on the market. It appears therefore that the craze generally is for whatever is THE LATEST drug on the market and is backed up by propaganda and advertisement by the manufacturers. Many synthetics have come into the market and gone and there is no guarantee that Paludrine, which is only a couple of years old, is likely to have a longer life than any of the others; while quinine has stood all the tests of time and experience through a period of over three hundred years. If therefore, any unfair competition

starts, now between synthetic antimalarials on the one hand and natural quinine on the other, quinine should be given whatever protection is necessary either in the form of subsidy or tariffs on imports; and it should continue to be used in the whole country even if it is found to be slightly more expensive than the synthetics on the market. It should not be forgotten that quinine is the product of the National Industry which it has taken India eighty eight years to build up to the present position and a capital of a few crores of rupees has been sunk into it. It is very easy to lose the industry but very difficult to build up again.

All the members present at the Conference unanimo-usly agreed with these views and suggestions of mine and the Conference considered that safeguards were necessary and recommended that:

a) the annual off-take by individual provinces should be fairly uniform and that Government of India should send a circular to all Provinces to this effect; and

(b) that protection should be given to the quinine industry as in the case of other industries either in the form of subsidies or protective tariffs or both. While affording such protection an enquiry should be instituted into the efficiency of production in the industry to see that waste is avoided and that the production is carried on in a sound and economical manner.

(7) Question (5) on the agena was next taken up, which reads as follows:

"Is it desirable as a precatuionary measure, to build up, in addition to the quinine stocks we hold a stock of syntehtic (anti-malarial drugs so as to make India self-sufficient? If so, for what period and in what quantities? In this connection what should be considered the probable annual consumption of quinine and of anti-malarial drugs in the light of recent expansion of consumption and probable expansions resulting from development of the health services?".

In discussing this questinn, I pointed out that even with the small present production of quinine in the country, stocks of cinchona products have been remaining unsold for a long time and this might lead one to the inference that there is no great demand for quinine and other cincohona products. But everywhere one hears of complaints that quinine is very scarce and cannot be obtained, which indicates that obvoisly there is great demand for quinine; only, people are not able to procure it easily. That there is a great demand for quinine - this demand being greather than supply - is also proved by the fact that Government of India thought it fit to impose a control over the supply and distribution of quinine. Then if, as is being experiencednow, some stocks of Cinchona products are reamining unsold for a long time, the conclusion that naturally follows is, that the anomalous position is almost entirely due to some serious defects in the distribution system. This is the exporence of both Bengal and Madras Cincohna Departments - i.e. allotments now being sold out and dead stocks of cinchona products accumulating. The position of Government quinine being this, I pointedly drew attention to the repercussions that might follow from the recent decision of the Government of India (their Ministry of Health's Notification No. F,7.16/47.D dated 1st April 1948) to relax control over imports of quinine into this country with effect from 1st April 1948 but at the same time to continue to maintain control over distribution of all Government stocks. This would almost certainly result in further accumulation of dead stocks with the Provincial Governments of Madras and Bengal and would worsen the situation once production is stepped up in Madras with the new factory commencing work. I submitted that, by the present policy of the Government of India of continuing restrictions of the sale and distribution of Government quinine and at the same time allowing free imports and distribution of foreign made - quinine and synthetics - we are

in effect, encouraging the sales of foreign made quinine and synthetics and popularising them in the market, and making the people forget the indigenous Government manufactured uinine. I argued that Government quiinine should be allowed to be sold out first without any restrictions whatsoever and that it should not be hoarded to build up the so-called reserve stock. Any reserve stock could be built of syntehtic anti-malarials. The large stocks of mepacrine hydro-choloride now lying on the hands of the Government of India could be treated as part of the reserve stock as nobody wants this now and there is no other way of disposing it

The Committee generally agreed that this was so and it was decided that while continuing the control over Government quinine to prevent it finding its way into the black market, the Government of India should address all Provincial Governments in the matter and draw their attention to the fact quinine allotments are not/fully consumed by them and asking them to make full use of the available and allotted quanitites of quinine. As regards reserve stock with the Government of India, it was decided to keep a reserve of three years' requirements to meet unforeseen emergencies, the present stock of mepacrine being treated as part of the reserve stock. For this purpose the annual requirements (or more correctly the annual consumption) of India of both quinine and other anti-malarials have been taken as the equivalent of 400,000 pounds of quinine.

In wanting to continue the present control over the distribution of Government quinine one of the main objects of the Government of India seemed to be to prevent the quinine from finding its way into the blackmarket. Personally, I feel that continuance of control over Government quinine is resulting in our losing market for Government Quinine while imported quinine is having free sway in the market. If the fear is that Government quinine, if not controlled, will find its way into the blackmarket, there is nothing, as far as I can see, to prevent the imported quinine from finding its way into the black-market.

8. The next question on the agenda, question 6, dealt with insecticides, the question reading; "What quantities of insecticides, D.D.T. and Pyrethrum, should be stock to make India self-sufficient? In doing so, for what period and in what quantitites should provision be made."

It was decided to manufacture 1,000 tons of D.D.T in India to start with and increase it later to 5,000 tons. The target for Pyrethrum was a production of 400 tons of flowers annually. It was specifically brought to the notice of the Committee, in this connection, by Mr. P.M. Nabar, Chief Advisory Chemist, Directorate General of Health Services, that the Madras Pyrethurm, especially that grown on the Palani Hills, ranked as the best in the World with a Pyrethrin content of 1.7% as against 1.2% in the flowers grown in Kenya. The Committee considered it essential to continue the cultivation of Pyrethrum in India in spite of the advent of D.D.T. into the market. Our experience of D.D.T. is very short and nobody really knows what toxic effects D.D.T. may produce after a long time.

It was, however, decided that until the D.D.T. industry develops in India, a two years' stock of this insecticide be maintained in India. Pyrethrum being locally produced, no stock figures were mentioned with respect to it.

9. Under agenda item No.7, namely, "Any other items for consideration" ere considered the following:-

(a) The Russian Method of quinine production: By this was really meant the extraction of alkaloids from the wood and leaves of the Cinchona plant which are now rejected. The Principal Quinine Officer recommended that the experiments now being conducted with the pilot plant in Calcutta be continued for a period of six months to one year. The recommrnedation was accepted by the Conference.

(b) Production of Synthetic anti-malarials in India: The Committee

recommended that the manufacture of synthetic anti-malarials be taken up in India as early as possible and along with it arrangements must be made for conducting research also on synthetic anti-malarials.

(c) Private enterprise in Cinchona: A point was raised before the Committee as to how enquiries regarding private enterprise in Cinchona were to be dealt with. It appears that there have been some enquiries from private manufacturers for starting quinine manufacture. I pointed out that the production capacity of both Bengal and Madras, together with expansion decided on earlier in the Conference, would be quite adequate to meet the quinine requirements of India which have been estimated at 2,10,000 pounds of quinine and as such there is really no room now for new enterprise in quinine manufacture. We in Madras had more factory production capacity than plantations can support and therefore, I said, there need be no objection to private enterprise taking up cinchona planting in fact they could be encouraged to do so, as the Madras Cinchona Department would welcome privately grown bark with the present inadequate supplies of bark. The Committee agreed with this view and it was decided to give all possible encouragement and help to private planters who want to take up cinchona cultivation on condition that the bark will be supplied to the Government factories, but that no private quinine factories should be allowed to be started as it would upset the balance of quinine production in India.

The Bengal Cinchona Department is said to be selling to private manufacturers twig bark of cinchona (for the manufacture of tinctures) at rupee one per pound, but I personally cannot say whether it is a good policy to do so.

(d) Quinine for the manufacture of ampoules for injection: It was decided that Quinine Bi-hydrochloride powder may be released liberally to private ampouling firms for the manufacture of ampoules, provided Government are satisfied about the bonafides of the firms and provided also that ther will be no misuse of the quinine so released.

(e) It was brought to the notice of the Committee by me earlier in the Conference that Madras Province had a dead stock about 10,000 lbs. of Febrifuge and amore or less equally large quantity of totaquina (the actual stock now being Febrifuge about 18,000 lbs. and Totquina about 10,500 lbs.). The Committee recommended that whenever dealers wanted to import totaquina from a dollar area (the number of such dealers was reported to be farily large) the should be supplied from the Madras Government stocks of Totaquina and/or Febrifuge.

(f) Manufacture or spraying equipment: With regard to the supply spraying equipment for D.D.T. it was recommended that the manufacture of these in India should be increased considerably.

Sd/. A.Y. SWAMY.
Director Cinchona Department.

AGENDA FOR THE MEETING OF THE QUININE POLICY COMMITTEE TO BE HELD AT 3.00 P.M. on 23rd April 1948.

1. Is quinine an essential drug for the treatment of malaria even with the availability of syntehtic antimalarial drugs in sufficient quantities?
2. Taking into consideration the minimum quantity of quinine, if any, considered essential for the treatment of malaria as well as the quinine required for the treatment of other conditions of illhealth what is the estimate of the probable annual requirement of the drug for the country?
3. Until such time as synthetic anti-malarials and the requisite basic chemicals can be manufactured on a large scale in India, what should be the policy as regards cinchona cultivation? Should it be expanded and, if so, to what extent within the next five years?
4. Are safeguards necessary for the survival of the quinine industry in India? If so, what safeguards can be suggested and for what period?
5. Is it desirable, as a precatutionary measure, to build up, in addition to the quinine stocks we hold, a stock of synthetic antimalarial drugs so as to make India self-sufficient? If so, wha for what period and in what quantities?
6. In this connection what should be considered the probable annual consumption of quinine and of antimalarial drugs in the light of recent expansion of consumption and probable expansions resulting from development of health services?
6. What quanitities of insecticides, D.D.T and Pyrethrum, should be stocked to make India self-sufficient? In doing so, for what period and in what quantities should provision be made?
7. Any other items for consideration.

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COPY OF MINUTES OF A CONFERENCE ON QUININE POLICY HELD IN NEW DELHI ON 23RD APRIL, UNDER THE AUSPICES OF THE CENTRAL MINISTRY OF HEALTH.

P r e s e n t.

Chairman : Dr. Jivraj N. Mehta, Secretary of the Central Ministry of Health and Director General of Health Services

CENTRAL GOVERNMENT REPRESENTATIVES

(a) Civil Health Services of the Central Government:

1. Mr. P.M. Menon	Joint Secretary, Ministry of Health
2. Dr. K.C.K.E. Raja	Dy.Director General of Health Services, New De
3. Lt. Co. M.K. Kelavkar	Durgs Controller, Dte. General of Health Services, New Delhi
4. Sri Ram Nath Chopra	Chairman, Committee on the Indigenous Systems of Medicine, Government of India.
5. Dr. B.C. Das Dupta	All. Dy.Director General of Health Services (Public Health)
6. Lt. Col. T.C. Puri	
7. Lt.Cl. Jaswant Singh,	Director, Malaria Institute of India.
8. Dr. I.M. Puri	Dy.Director, Malaria Institute of India.
9. Mr. P.M. Nabar	Chief Advisory Chemist, Dte. General of Health Services.
10. Mr. S.C. Sen	Principal Quinine Officer, Govt. of India.
11. Mr. J.M. Saksena	Asst. Secretary, Ministry of Health.
12. Dr. D.C. Sen	Representative of the Ministry of Industry and Supply.

(b) Military Health Services.

13. Col. K.M. Barucha	Dy.Director of Hygiene and Pathology, Medical Directorate, General Headquarters, India.
14. Lt. Cl.B.N. Bhandari	Army Specialist in Medicine, Medical Directorate, G.H.Q., India.

PROVINCIAL GOVERNMENT REPRESENTATIVES:

15, Dr. A.C. Banerjea	Director of Health and Medical Services, United Provinces.
16. Prof. R.N. Chauduri	Professor of Tropical Medicine, School of Tropical Medicine, Calcutta.
17. Dr. B.H.P. Pai	Professor of Medicine, Madras Medical College, Madras.
18. Dr. D.B. Viswanthan	Asst. Director of Public Health (Malariology) Bombay.
19. Dr. Daulat Ram Mehta	Public Health Department, East Punjab.
20. Dr. A.Y. Swamy	Officer-in-charge of Madras Government. Cinchona Plantations, Naduvattam. the Nilgiris, South India.

OPENING ADDRESS:

In his opening address to the conference the Chairman Dr. Jivraj N. Mehta, emphasised the fact that, in considering the future policy regarding the production of quinine in India, the question has to be viewed from various stand points. These include

a) the total basic requirements of India in respect of quinine for the treatment and prphylaxis of malaria even with the availability of synthetic drugs in sufficient quantities and at relatively cheap prices, taking into consideration the vast rural population and the need for distribution of all anti-malarial drugs mainly through non-medical personnel;

(b) the need for making India as self-sufficient as possible in the event of an emergency resulting in the stoppage of or a considerable reduction, in the flow of quinine and of synthatic drugs from mal foreign sources;

(c) the time that is bound to elapse before the indigenous ppodcution of synthetic drugs, including that of certain requisite basic chemicals, is promoted on a large scale in the country and in more than one centre; and

(d) the need at the present moment, of consering foreign currency as much as possible and particularly the American dollar available for th use of the Country.

DISCUSSION

The main points that emerged during the dicussion that followed are shown below:

(1) The relative non-toxicity of quinine and the safety with which it can be distributed among the rural inhabitants without the assistance of medical personnel were urged as points in favour of this drug as against synthetic anti-malarials.

2. It was, however, pointed out by some members that, quinine being a bitter drug, it would not be taken in sufficient quantities by the people to produce its curative or prophylactic effect. On the other hand it was claimed for Paludrine that the single doese treatment of three tablets, which was recognised to be sufficient to cause a clinical cure, was a distinct advantage in dealing with the rural population, the distributor being able to ensure that the drug was taken by the patient. The tastelessness of Paludrine added to the readiness with which it would be accepted by the public ror consumption. The point was, however raised that, in the experience of Bombay, this form of treatment with Paludrine tended to produce the sezu l forms of the malarial parasite in larger numbers than when other forms of anti-malarial treatments were employed. This has great significance from the point of view of the malaria problem because the sexual forms are the ones which infect the mosquito and thereby keep up the cycle of infection between man and moquito. It would, therefore, seem necessary to ensure tha, if this method of treatment with paludrine is to be adopted, a vigorous anti-mosquito control is maintained through meaaures directed against both the larval and adult forms of the insect.

3. The Defence Military Medical Specialists mentioned that quinine was being given up by the Army and that pludrine was being substituted in an increasing measure. It was also pointed out that quinine was not so non-toxic as had been suggested while Paludrine was definitely less so. It was, however, admitted by the Army Specialists that quinine would remain as the country's sheet-ancho until the production of synthetic anti-malarials, including that o certain basic chemicals necessary for their manufacture, could be stepped up to a level which would make the country largely self-sufficient.

4. The Officer in charge of Cinchona Planatations, Madras Government stated that the Government had an expansion scheme for cinchona cultivation which aimed at the production of 80,000 to 100,000 lbs. of quinine in the course of the next fifteen years. That Government has recently constructed a factory costing about Rs.25 lakhs, which should be able to undertake this large scale productio n of quinine. The Principal Quinine Officer stated that the West Bengal Government was also working out a programme of production of 100,000 lbs. of quinine per year. It was pointed out that these figures admitted of a certain amount of elasticity as improved methods of extraction resulsted in a larger yield of the drug. Thus the schemes of the two producing provinces of Madras and Bengal would probably raise the total indigenous production of quinine to about 200,000 to 250,000 lbs. per annum within the next ten to fifteen years, compared with the average annual rate of production during the theree years 1943-44 to 1945-46 about 100,000 lbs. for the two provinces together.

5. During the discussion certain points in regard to quinine production which are important were brought about.

(a) It was pointed out by the Principal Quinine Officer that 90 per cent of the quinine was due to an increase in wages of labour, about three to three and a half times of those before World War No.II. At the same time, in the cinchona plantations in South India, the experiment has been tried of replacing the standard method of planting trees at intervals of four feet either way by intervals of three feet. The result of this is that an acre is able to hold double the number of trees - about 5,000 compared with 2,300 per acre according to the

older method. Madras has been carrying on this experiment for the last years and it was stated that, as far as could be seen, no adverse effect in respect of growth of the plants had so far been demonstrated. It seems, however, necessary to wait for some more time in order to assess the effect of this closer system of planting trees on the yield of quinine, because maximum productivity is reached a few years later. If the Government of Madras finds this system of close planting satisfactory from the point of view of yield of quinine from individual trees, its adoption on a large scale should help considerably towards reducing the price of quinine.

(b) Questions relating to the distribution of quinine, particularly in the rural areas, were also discussed. It was pointed out that, without a large scale expnsion of health services, distribution on a satisfactory basis would be difficult. Some years ago the Government of India made a large grant of quinine to the provinces on the condition that the drug was to be distributed free to the rural population. The experience of that scheme was that, owing to unsatisfactory control over distribution, some proportion of the quinine thus distributed was reported to have found its way into the markets of a few of the larger cities in the country. Quinine distribution, unless it is developed on a sound basis, is likely to result not only in loss of money to Government but also in failure to secure the main purpose in view, namely, that of making the drug available to the people, particularly in rural areas, for preventive and curative purposes.

AGENDA ITEM No. 1: Is quinine an essential drug for the treatment of malaria even with the availability of synthetic anti-malarial drugs in sufficient quantities?

The Conference considers that, although in course of time, the consumption of quinine will largely be replaced by that of synthetic drugs, quinine production must be increased in the immediate future, taking into consideration the many factors involved in the laying down of a quinine policy for the country.

AGENDA ITEM No.2 :- Taking into consideation the minimum quatntity of quinine, if any, considered essential for the treatment of malaria as well as the quinine required for treatment of other conditions of ill-health what is the estimate of the probable annual requirements of the drug for the country?

The estimate of annual requirement of quinine for the country is 200,000 - 2,50,000 lbs. Existing schemes for expansion of cinchona cultivation in the two producing provinces of Madras and Bengal are intended to reach this target within the next 10 to 15 years and these schemes should therefore be supported.

Whether it be in the form of purified alkaloids or of cinchona febrifuge, the cost will not differ materially and the target of 200,000 to 250,000 lbs. is inclusive of both purified salts and of febrifuge. When however cinchona trees are planted at three feet intervals either way, there is bound to be a reduction in cost.

The present system of allotment of quinine to the provinces should be looked into and revised, if necessary.

Existing methods of distribiting quinine, particularly in the rural areas, require careful investigation and suitable rectification, wherever necessary.

AGENDA ITEM NO. 3 :- UNTIL such time as synthetic anti-malarials and the requisite basic chemicals can be manufactured on a large scale in India, what should be the policy as regards cinchona cultivation? Should it be expanded, and if so, to what extent within the next five years?

During the next five years expansion of inchona cultivation is recommended as shown below:-

(a) In Madras to the extent of 5000 - 6000 acres: and
(b) In Bengal to the extent of 2500 tons.

AGENDA ITEM No.4 - Are safeguards necessary for the survival of the quinine industry in India? If so, what safeguards can be suggested and for what period?

Safeguards are necessary and the following recommendations are put forward:

a) The annual off-take by individual provinces should be fairly uniform;

(b) Protection of the quinine industry is necessary, as in the case of other industries, either in the form of subsidies or of protective tariffs or both.

The provision of such protection should be accompanied by a rigorous enquiry into the existing methods of quinine production and by the enforcement of economical means of production.

re--- of the situation should be carred out at the end of every five years.

AGENDA ITEM No.5 - It is desirable, as a pre-cautionary measure to build up, in addition to the quinine stocks we hold, a stock of synthetic anti-malarial drugs so as to make India self-sufficient. If so, for what period and in what quantities?

In this connection what should be considered the probable annual consumption of quinine and of anti-malarial drugs in the light of recent expansion of consumption and probable expansions resulting from development of health services?

It is recommended that the country should hold a three-year stock made up of quinine and of synthetic antimalarial drugs in amounts equivalent to quinine in terms of dosage. In regulating such stocks, the experience of mepacrine should not be forgotten. We have imported large quntities of this drug but, with the advent of Paludrine in the market, mepacinr is at present lying on our hands. To enable mepacrine to be used up we had perforce to advise the Chief Controller of Imports to cut down the import of Paludrine, a drug in several respects superior to mepacrine. In regulating the stock of synthetic anti-malarials it would be necessary to be constantly on the alert to see whether further researches do not bring into larger scale production other synthetic drugs superior to Paludrine. It may be added that, inmaintaining the stock, account should be taken of the mepacrine avalable with the Disposals Directorate. If the Army authorities do not require it, it should be taken over as part of the reserve for the civil population.

Quinine and antimalarials as quinine equivalents together corresponding to a total of 400,000 lbs. of quinine should be taken as the present annual rate of consumption in the country.

AGENDA ITEM No. 6 - What quantitites of insecticides DDT and Pre Pyrethrus should be stock to make India self-sufficient. In doing so, for what periods and in what quantities should provision be made?

The production of DDT in India is at present about 1000 lbs. per annum. The representative of the Industries and Supplies Ministry said that it was expected that, in two or three years, the country would be able to produce 1,000 to 1,200 ~~lbs.~~ tons of DDT per year. Alembic Chemicals and Mettur Chemicals were each planning to produce 300 tons a year of this insecticide.

Present production of pyrethrum flowers is esimtated at 100 tons per year. In this connection it is worthy of notice that the Pyrethurm content of the flowers produced in Madras is 1.7 per cent as against 1.2 per cent in respect of Kenya flowers.

As recommended by the Director of Malaria Institute of India the Conference agreed to the targets of 5,000 tons of DDT and 400 to of Pyrethrum flowers per year for the country during the next five

DDT is estimated to last without deterioration for a period of three to four years. It is recommended that, until the industry develops adequatly in India, a two year stock of this insecticide should be maintained. Pyrethrum being locally produced it would not be necessary to maintain large stock of it.

AGENDA ITEM No.7 - ANY OTHER ITEMS FOR CONSIDERATION:

(a) Russian Method of Quinine production: The Principal Quinine Officer explained the present position re: the experiment which is being conducted in Bengal with a view to the maximum utilisation of the cinchona plant. He urged that the experiment in progress with the pilot plant should be continued for a period of 6 months to one year. Normally quinine is manufactured only from the bark of the plants, while the experiment has sought to secure extraction of quinine alkaloids from the wood and leaves also. This should add to the total production by about 20 per cent. The conference recommended the continuance of the experiment for a period of six to twelve months.

(b) Production of synthetic anti-malarials in India: The Conference strongly recommended that the production of synthetic anti-malarials in the country should be speeded up as much as possible and that, to provide against war emergencies, it would be highly desirable to construct factories for their production in at least three centres suitable for the purpose in different parts of the country.

(c) Private enterprise in the production of quinine: The representative of the Ministry of Industry and Supply pointed out that the Bombay Burma Trading Corporation had a cinchona plantation of its own in the Province of Madras the bark from which was being made available for the extraction of quinine to the Government Cinchona factory in that province. The view of the conference was that, while private enterprise in cinchona cultivation could be encouraged, the establishment of private factories for the manufacture of quinine should not be permitted. The bark produced by private agencies should be made over to Government factories for extraction

(d) Quinine for the preparation of ampoules for injection: Requests from manufacring frims for quinine to prepare ampoules for injection may be allowed liberally but with discretion by Government, so that there is no misuse of quinine so allowed.

(e) Totaquina or Cinchona Febrifuge: The Government of Madras has a surplus stock of about 10,000 lbs. of cinchona febrifuge. The Conference recommended that firms applying for import licences for totaquina to the Chief Cojtroller of Imports s hould be advised to approach the Ministry of Health in order that such requests may be diverted to the Government of Madras so as to facilitate the using up of the surplus stock of cinchona febrifuge.

(f) The Manufacture of spraying equipment in India: The need for promoting the manufacture of equipment in India necessary for spraying D.D.T. etc. , was stressed by the Conference. The representative of the Ministry of Industry and Supply stated that such equipment was now being manufactured in India and that, if Provincial Governments or the Malaria Institute of India approached his Ministry with their requirements, it would be possible to stimulate production to the level required by the country.

JIVRAJ N. MEHTA.

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GOVERNMENT OF MADRAS
Abstract
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CINCHONA - Quinine Policy - Conference held in April 1948 at New Delhi under auspices of Central Ministry of Health - Minutes - Recorded.

Development Department

G.O. (Ms) No. 4311 Dated, the 18th August 1948

READ - the following:-

Letter from the Director, Cinhona Department, Rc. No. 1153-A2/48 dated the 16th June 1948.

ORDER:

R e c o r d e d.

(By order of His Excellency the Governor)

W.R.S. SATTIANADHAN
Secretary to Government.

To the Director, Cinchona Department, Ootacamund.
To the Surgeon-General with the Government of Madras.

/True copy/

Office Assistant,
Madras Record Office, Egmore.

Sk.

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